



Welcome to Chemistry

Please pick up a notebook and the safety contract and find your assigned seat.

Safety contracts are due FRIDAY!

ChemCatalyst (Copy and answer the part in yellow on the lefthand page)

Long ago, early scientists tried to turn ordinary things into gold. This pursuit was called alchemy and the people who engaged in alchemy were called alchemists.

•Do you think the alchemists were successful in turning things to gold? Explain your thinking.



Procedure

- 1 Read the text passage on this page. Use a pencil or highlighting pen to mark any words or phrases you think might be clues to the text's meaning.
- 2 As a team, use the description of common symbolism for alchemical substances, principles, and elements on the "Keys to the Stone" handout to decipher the text. Note that some symbols and images have more than one meaning.
- 3 Together, write your interpretation of the text on a separate piece of paper, and then share your work with the class. When interpreting the text, refer to the line number in which the word or phrase appears.

Some Common Symbols in Alchemical Texts and Images

baths: cleansing; dissolving a solid in a liquid

black cow: black or purifying matter

black raven/blackbird: a black mixture

bone of whale: a white mixture

child: offspring of the king and queen, the result of their marriage or union; a naked child symbolizes the innocent soul; a child crowned or clothed in purple robes signifies salt or the Philosopher's Stone

crown: completion; perfection of a metal

dragon/serpent: fire; the dragon in flames is a symbol of fire and calcination (breaking down a substance by heating or burning it); dragons with wings represent the volatile principle

hermaphrodite (half man/half woman): conjunction; the union of two opposites

egg: the sealed vessel of creation

king: man, solar consciousness, and gold; the red king is sophic sulfur (considered the seed of gold); the king united with the queen symbolizes conjunction (the joining of two opposite natures)

lion: raw matter and acid; red lion is the red acetate of lead in crystalline form; green lion is the green acetate of lead in liquid or crystal form; black lion represents carbon; the winged lion is mercury or sophic salt

ouroboros (a serpent biting its tail): completion

queen: woman, lunar consciousness, and silver; the white queen is sophic mercury (considered the quintessence of metals); the queen united with the king is the operation of conjunction (the joining of two opposite natures)

stag: the soul

trees: the process of transformation

whale: water

wolf, grey wolf: *albite*, an ore of antimony

Metals Used by Alchemists

antimony: wolf, grey wolf

gold: sun, king, perfect sphere, Leo the Lion, Sunday

silver: moon, queen, white rose, crescent, rain cup, Cancer the Crab, Monday

iron, Mars: shield and spear, Scorpio the Scorpion and Aries the Ram, Tuesday

mercury: Mercury or Hermes, caduceus (twined serpents on a staff), Virgo the Virgin and Gemini the Twins, Wednesday

sat: Jupiter, lightning, Pisces the Fish and Sagittarius the Archer, Thursday

copper: Venus, hand mirror, Taurus the Bull and Libra the Scales, Friday

lead: Saturn, old man carrying a scythe or hourglass, Capricorn the Goat and Aquarius the Water Carrier, Saturday

Properties of the Alchemical Principles

sophic sulfur: symbolized by the red king or red rose

sophic mercury: symbolized by the white queen or white rose

sophic salt: symbolized by the ouroboros, the stone, and the astral body

Alchemical Elements

air: spirit into the manifested world; hot and wet; sanguine

earth: manifestation, birth, and material creation; cold and dry; melancholy

fire: activity and transformation; hot and dry; choleric

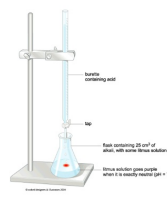
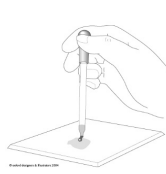
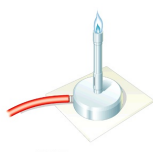
water: cleansing and purification; cold and wet; phlegmatic



1 If you would operate by means of our bodies, take
2 a fierce grey wolf, which, though on account of its
3 name it be subject to the sway of warlike Mars, is
4 by birth the offspring of ancient Saturn, and is found
5 in the valleys and mountains of the world, where he
6 roams about savage with hunger. Cast to him the
7 body of the King, and when he has devoured it, burn
8 him entirely to ashes in a great fire. By this process
9 the King will be liberated; and when it has been
10 performed thrice the Lion has overcome the wolf,
11 and will find nothing more to devour in him. Thus
12 our Body has been rendered fit for the first stage
13 of our work.

Notes (righthand page)

- Chemists have a set of tools that are useful for studying matter.



- Chemistry laboratories have a number of potential hazards. It is important that you behave responsibly and know how to use the safety equipment.

Check-In (Copy and answer the part in yellow on the lefthand page)

Where are these items located in your classroom? (Sketch or describe)

- graduated cylinder
- hot plate
- eye wash
- fume hood
- scale or balance
- fire extinguisher
- goggles

The Big Question

- Can we turn a penny into gold?



Activity

Purpose: In this activity you will be transforming a copper penny and discussing what happens.

Safety Notes:

- You must wear safety goggles at all times.
- DANGER! Sodium hydroxide will burn skin, eyes, and clothing.
- Be careful of the hot plates and the open flames.

Making Sense (Copy and answer the part in yellow on the lefthand page)

- Do you think you made real gold?
- How could you find out?

ChemCatalyst (Copy and answer the part in yellow on the lefthand page)

Modern chemistry is defined as the study of matter.

- *What do you think matter is?*
- *Name two things that are matter and two things that are not matter.*

Activity

Purpose: In order to study matter, it is important to understand what matter is and what qualities all matter possesses. In this lesson you will work to come up with a definition for matter.

Matter	Unsure	Not Matter



Notes

Here are some textbook definitions of **matter**:

- Matter is anything that has mass and volume.
- Matter is anything of substance in the known universe.
- Matter is anything that takes up space.
- **Energy** is the ability of a system to do work or supply heat.
 - Energy is not considered to be matter because it does not take up space nor does it have mass.

Making Sense (answer on the exit slip and turn in)

Pick one of the items that you consider to be “not matter”.

- State why you believe that particular item is something other than matter.
- Show how it doesn't fit your definition of matter.

Check-In (Copy and answer the part in yellow on the lefthand page)

Which of the following can be classified as matter according to our definition? If it is matter answer YES, if it is NOT matter answer NO.

- a) a beam of sunlight
- b) an automobile
- c) an idea
- d) your breath
- e) rain
- f) sadness